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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/555,714	07/27/2006	Jorg Kowalczyk	P2107-285	9742
2352 7590 01/04/2010 OSTROLENK FABER GERB & SOFFEN 1180 AVENUE OF THE AMERICAS NEW YORK, NY 100368403				
EXAMINER				
BLAND, LAYLA D				
ART UNIT		PAPER NUMBER		
1623				
MAIL DATE		DELIVERY MODE		
01/04/2010		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/555,714

**Applicant(s)**

KOWALCZYK ET AL.

**Examiner**

LAYLA BLAND

**Art Unit**

1623

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 November 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-46 and 73-81 is/are pending in the application.
- 4a) Of the above claim(s) 14,15,19,20,39-42,45,46 and 76 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13,16-18,21-38,43,44,73-75 and 77-81 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 11/5/2009
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This office action is a response to Applicant's remarks submitted November 5, 2009.

Claims 1-46 and 73-81 are pending. Claims 14, 15, 19, 20, 39-42, 45 and 46 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on March 4, 2008. Claims 1-13, 16-18, 21-38, 43-44, 73-75, and 77-81 are examined on the merits herein.

The following rejections of record are maintained.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-13, 16-18, 21-38, 43-44, 73-75, and 77-81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Biella et al. (Journal of Catalysis, 206, 242-247, 2002, PTO-1449 submitted November 4, 2005) in view of Fuertes et al. (US 4,985,553,, January 15, 1991, PTO-1449 submitted November 4, 2005) and Biella et al. (Catalysis Today 72 (2002) 43-49, PTO-1449 submitted November 4, 2005).

Biella et al. (Journal of Catalysis) teach the selective oxidation of glucose to gluconic acid using gold on carbon catalyst [see abstract]. The particle size was 2-5 nm and the support had a final gold loading of about 1 wt% [page 243, 2.2.1]. Reactant/metal ratio was about 1000. Experiments were done by bubbling dioxygen through an aqueous slurry, at atmospheric pressure (1 bar), at pH 7, 8, or 9.5, at 323 K (about 50°C). When the pH was not controlled, experiments were done at 30 kPa (3 bar) and 363 K (90°C) [page 243, 2.3]. Very high (>99%) selectivity was obtained [page 246, 3.3]. The gold catalyst has improved activity and selectivity over palladium or platinum catalysts [page 242, Introduction].

Biella et al. do not teach oxidation of oligosaccharides such as the elected species maltose, and teach carbon support instead of metal oxide solid support.

Fuertes et al. teach a process for selective oxidation of di-, tri-, oligo-, and polysaccharides using an oxygen-containing gas in the presence of a noble metal based catalyst such as palladium, platinum, rhodium, or osmium on solid support [see abstract]. Disaccharides such as lactose are contemplated [column 2, lines 1-16]. Solid supports including alumina and titanium oxide are taught [claim 16]. The quantity of catalyst used should be between 0.005 and 1 wt% with respect to the polysaccharides [column 3, lines 58-63]. The reaction temperature should be between 20°C and 90°C [column 3, lines 65-68]. The pH should be between 7.5 and 11.0, preferably between 8.0 and 10.0 [column 4, lines 13-15].

Biella et al. teach application of gold catalysts to selective liquid phase oxidation, using  $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{TiO}_2$ , or C as solid support [page 45, Table 1]. Oxidation of glucose is taught [page 38, 3.5].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to oxidize maltose using the method of Biella et al. (Journal of Catalysis), and to modify that method to include solid supports such as  $\text{Al}_2\text{O}_3$  or  $\text{TiO}_2$  in place of carbon. The Supreme Court in KSR reaffirmed the familiar framework for determining obviousness as set forth in *Graham v. John Deere Co.* (383 U.S. 1, 148 USPQ 459 (1966)), but stated that the Federal Circuit had erred by applying the teaching-suggestion-motivation (TSM) test in an overly rigid and formalistic way. KSR, 82 USPQ2d 1385. Exemplary rationales that may support a conclusion of obviousness include simple substitution of one known element for another to obtain predictable results.

In this case, the skilled artisan could arrive at the claimed invention by simple substitution of one known element for another. The prior art teaches a method which differs from the claimed method by the substitution of some components (oxidation of glucose, gold on carbon support) with other components (oxidation of maltose, gold on metal hydroxide support). Gold catalysts on metal hydroxide supports, used in oxidation reactions, are known in the art as an alternative to gold on carbon. Gold catalyst is known in the art as an attractive alternative to platinum or palladium catalyst, and has been used to oxidize glucose. Oxidation of maltose, which is a disaccharide formed from two glucose molecules, using platinum or palladium catalyst is known in

the art. Thus, the skilled artisan could have substituted maltose for glucose, or metal hydroxide solid support for carbon solid support, and would have predicted similar results, because these are all known in the art as alternatives.

### ***Response to Arguments***

In the office action mailed August 5, 2009, the examiner explained why Applicant's examples are not commensurate in scope with the claims and thus not sufficient to overcome the rejection. In the response submitted November 5, 2009, Applicant argues that the prior art shows a strong prejudice against metal oxide supports for gold catalysts. Applicant refers to the Sheldon references (PTO-1449 submitted November 5, 2009), which state that carbon supports are recommended because of their stability at low pH and that the oxidation of glyoxal to glyoxylic acid is more effective using Pt/C than Pt/metal oxide supports. This argument has been carefully considered but is not persuasive. The prior art teaching that carbon supports are recommended for their stability at low pH is not a teaching away from the use of metal oxide supports because metal oxide supports are used at high pH, as taught by Biella and Fuertes. The instant claims are not limited to reaction at low pH. To the contrary, the only claims which limit pH at all are drawn to reaction at high pH, and Applicant's examples are done at high pH, which is consistent with the prior art. The prior art teaches oxidation of carbohydrates using Pt/metal oxide support, as taught by Fuertes. This teaching is closer to the instant claims than Sheldon, which is drawn to oxidation of glyoxal, not carbohydrates. Thus, the skilled artisan would not consider the prior art as a whole to teach away from the use of metal oxide supports.

Applicant has provided examples and argued that Applicant's catalyst is more durable than Biella's Au/C catalyst. Applicant refers to Figure 5 and the conclusion of Biella. It is noted that these portions are Biella are drawn to the durability of the catalyst at uncontrolled pH, while Applicant's comparative examples were done at pH 9. Biella teaches that the gradual decrease in catalyst activity was observed as pH decreased [conclusion]. Biella's Figure 3 shows that, at controlled pH 9.5, the catalyst is much more active. Although Biella does not show as many runs as Applicant's Example 3, it is clear from Figure 3 that 100% conversion is taking place within 100 minutes for at least the first four runs, and the decrease in activity for each run is less significant with each run (the drop in activity is much greater between runs 1-2 than between runs 3-4). Applicant's Example 3 reaction is run throughout the day, overnight or over the weekend. Because it is clear that conversion occurs over time, it is considered that longer reaction times would result in more conversion. Thus, it is not clear if Applicant's results are significantly better than Biella's results using Au/C at controlled pH. The burden is on Applicant to establish "that the differences in results are in fact unexpected and unobvious and of both statistical and practical significance." See MPEP 716.02(b).

For these reasons, the rejection is maintained.

### ***Conclusion***

No claims are allowed.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAYLA BLAND whose telephone number is (571)272-9572. The examiner can normally be reached on Monday - Friday, 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anna Jiang can be reached on (571) 272-0627. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Layla Bland/  
Examiner, Art Unit 1623

/Shaojia Anna Jiang/  
Supervisory Patent Examiner  
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